ONTARIO MINISTRY OF ENVIRONMENT
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OPERATING SUMMARY

THE REGIONAL MUNICIPALITY OF

SUDBURY

CHELMSFORD

WATER POLLUTION CONTROL PLANT

1974

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Chelmsford : water pollution control plant.

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REGIONAL OPERATIONS DIVISION

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R. Moore

MANAGER, UTILITY OPERATIONS
J. Wesno

CHELMSFORD

WATER POLLUTION CONTROL PLANT

operated for
The Regional Municipality of Sudbury
(Town of Rayside-Balfour)
by the
MINISTRY OF THE ENVIRONMENT

1974 ANNUAL OPERATING SUMMARY

prepared by

Plant Performance Unit

TECHNICAL SERVICES BRANCH

T. Cross, Director

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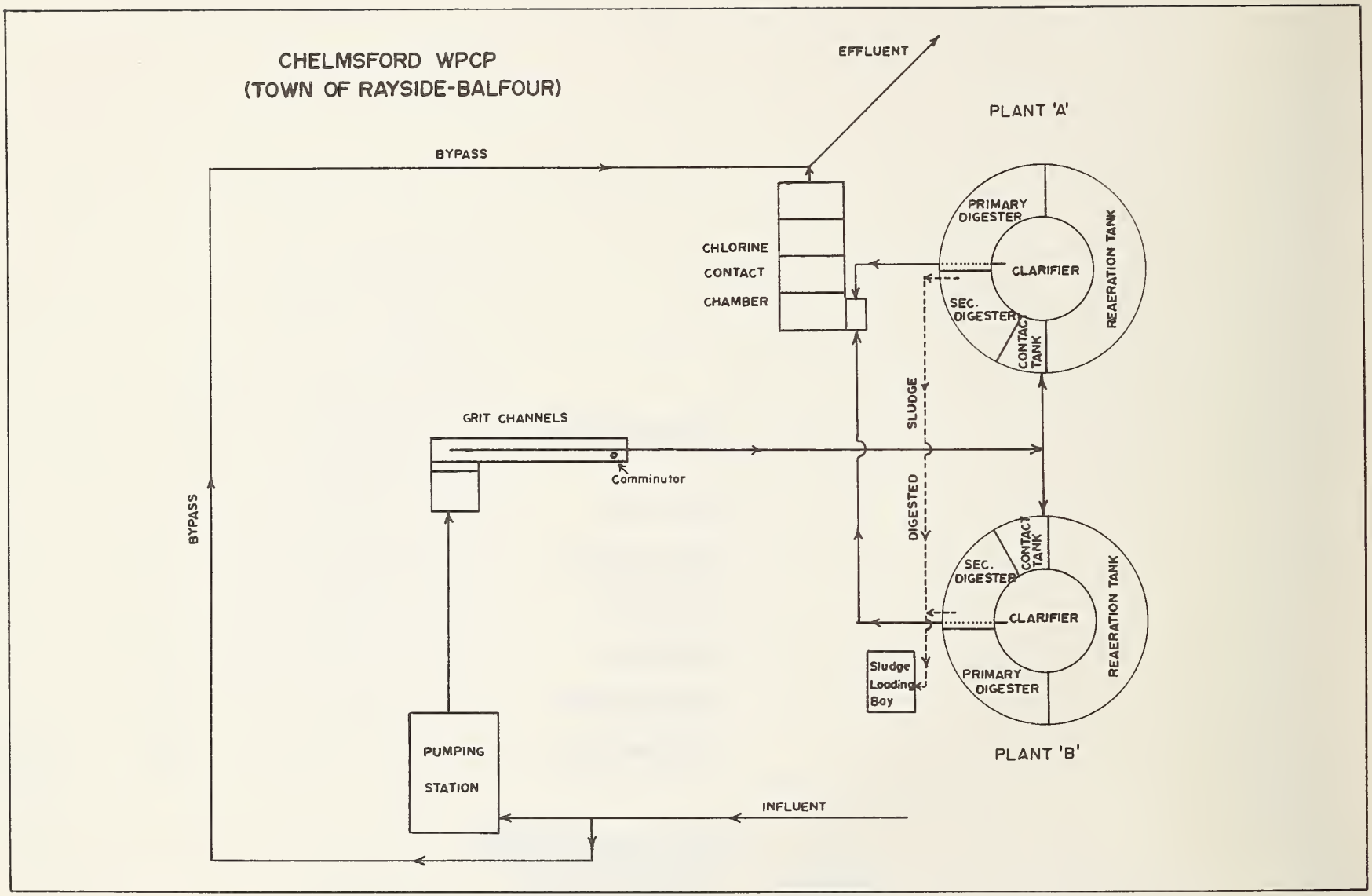

CHELMSFORD WPCP
(TOWN OF RAYSIDE-BALFOUR)
EFFLUENT
PLANT 'A'
BYPASS
CHLORINE
CONTACT
CHAMBER
PRIMARY
DIGESTER
CLARIFIER
REAERATION TANK
SEC.
DIGESTER
CONTACT
TANK
SLUDGE
GRIT CHANNELS
Comminutor
BYPASS
DIGESTED
CONTACT
TANK
SEC.
DIGESTER
CLARIFIER
REAERATION TANK
Sludge
Loading
Bay
PRIMARY
DIGESTER
PLANT 'B'
PUMPING
STATION
INFLUENT

DESIGN DATA

Project: Chelmsford WPCP
Project No: 2-1004-73
Design Flow: 1.2 MGD
Treatment: Extended Aeration
(built as Contact Stabilization)

GRIT REMOVAL
Type: Grit channels

BIOLOGICAL TREATMENT
One of two identical units described hereunder

CONTACT CHAMBER
Volume: 21,500 I.G.
Retention: 0.86 hr

RE-AERATION CHAMBER
Volume: 156,000 I.G.
Retention: 6.2 hr

CLARIFIER
Volume: 164,000 I.G.
Retention: 6.6 hr

AEROBIC DIGESTER NO. 1
Volume: 65,500 I.G.

AEROBIC DIGESTER NO. 2
Volume: 65,500 I.G.

CHLORINE CONTACT CHAMBER
Common to both plants
Volume: 30,000 I.G.
Retention: 36 min

'74 Review

GENERAL

The Chelmsford Water Pollution Control Plant consists of a 1.25 MIGD extended aeration treatment plant and an on-site pumping station.

The plant was put into operation in the latter part of February and a very good quality of effluent was being produced by May.

Some difficulties were experienced initially with the electrical motor control centre especially with regard to the large blower motors. These deficiencies were rectified by the contractor under warranty.

Several sludge haulers from the Rayside Balfour area were permitted to dump septic wastes into the plant on a trial basis. This practice had to be terminated as the septic wastes shock loaded the plant, resulting in serious process upsets. The large quantities of scum associated with the wastes also created severe clean up problems of the treatment facilities.

The A & B plants were operated during the winter months to avoid frost damage but the process suffered slightly as there was not enough raw sewage to sustain the proper biological life in both plants.

EXPENDITURES

The total operating cost for 1974 was $31,262.00.

PLANT FLOW AND CHLORINATION

The total flow for 1974 was 93.0 million gallons which represented an average flow of 0.32 MIGD.

There were no incidences of by-passing raw sewage in 1974.

A total of 1,161 lbs. of chlorine was used to disinfect the final effluent from May to October 1974 representing an average dosage of 3.5 mg/l.

PLANT EFFICIENCY

The average BOD concentrations in the raw and treated sewage were 173 mg/l and 19 mg/l respectively. This represents a removal efficiency of 89%.

The average SS concentration in the raw and treated sewage were 184 mg/l and 9 mg/l respectively representing a removal efficiency of 95%.

AERATION

The average MLSS concentration in the aeration section was 9200 mg/l. The average organic loading to the aeration section was 0.05 pounds of BOD per lb. of MLSS.

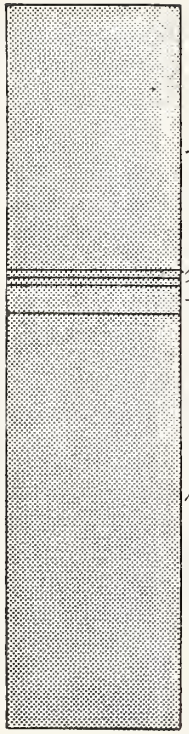
SLUDGE DIGESTION AND DISPOSAL

Due to the fact that there was very little sludge produced in 1974 (i.e. low hydraulic loading), staff were able to dispose of the sludge on the plant grounds. The well digested sludge provided for a very good soil conditioner of the plant grounds.

CONCLUSIONS

The raw sewage flows were considerably below plant capacity with the exception of several days during the spring run-off period when the flows were at approximately 0.80 MIGD. Due to the low hydraulic loading on the plant, the effluent quality remained high at all times.

ANNUAL COSTS



1974 OPERATING COSTS

SALARIES & WAGES	35 %
EMPLOYEE BENEFITS	1 %
TRANSPORTATION & COMMUNICATIONS	1 %
SERVICES	4 %
SUPPLIES & EQUIPMENT	59 %
AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS	0 %
TRANSFER PAYMENTS	0 %
OTHER TRANSACTIONS	0 %

YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	UNIT COSTS $/M.G.	UNIT COSTS ¢/lb BOD
1974	93	31262	336	22

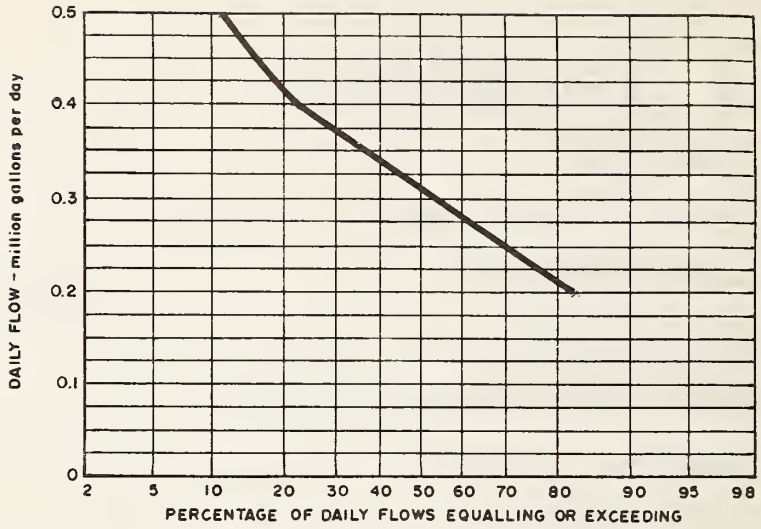
Flows from March 16

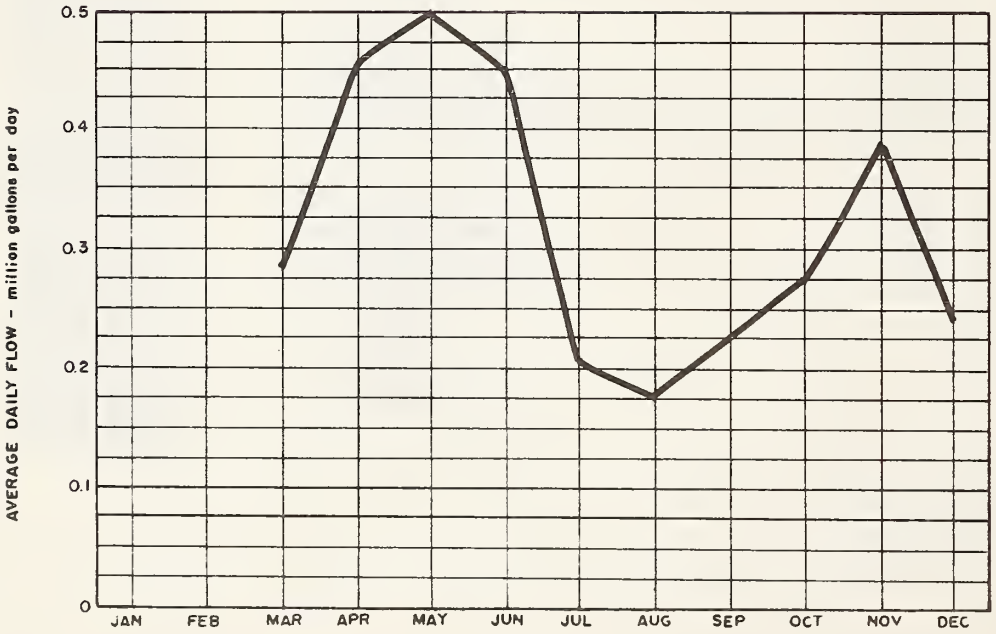
OPERATING EXPENDITURES

Regular Staff	$ 10744	$
Casual (Unclassified) Staff	180	
TOTAL SALARIES AND WAGES		10924
TOTAL EMPLOYEE BENEFITS		394
TOTAL TRANSPORTATION AND COMMUNICATIONS		201
Insurance		
Sludge Haulage	972	
Repairs and Maintenance	36	
Other Services	135	
TOTAL SERVICES		1143
Machinery and Equipment	2526	
Chemicals	3799	
Utilities	8594	
Other Supplies and Equipment	3681	
TOTAL SUPPLIES AND EQUIPMENT		18600
TOTAL AQUISITION/CONSTRUCTION OF PHYSICAL ASSETS		
TOTAL TRANSFER PAYMENTS		
OTHER TRANSACTIONS		
GRAND TOTAL	GRAND TOTAL	$ 31262

PROCESS DATA

FLOWS



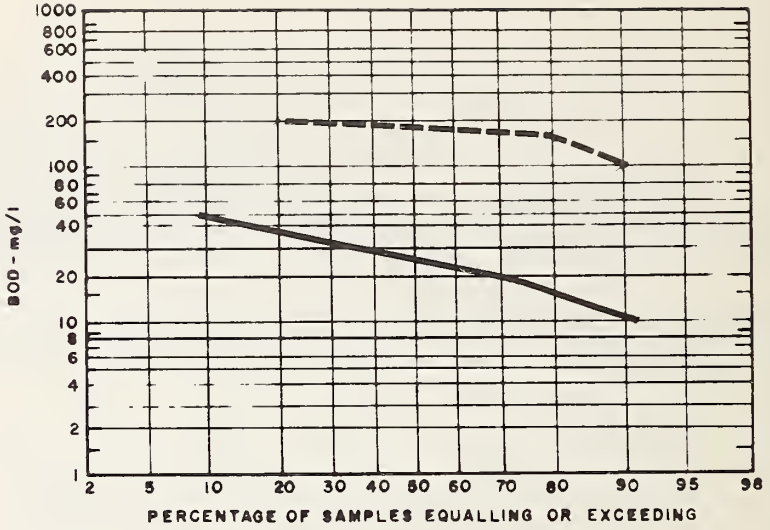


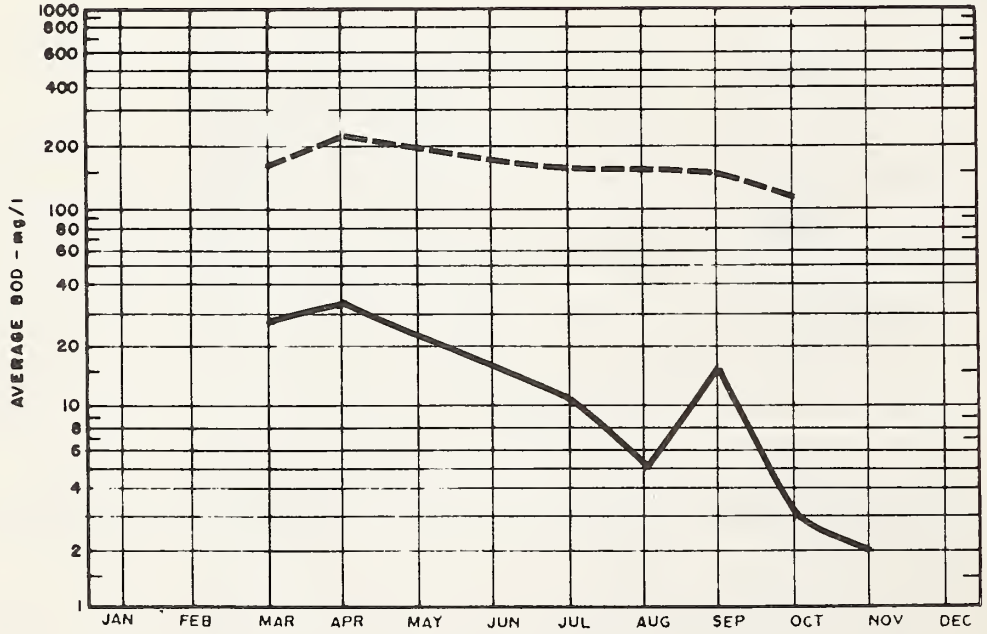
DESIGN CAPACITY _ _ _ _ _ _ _

PLANT PERFORMANCE

MONTH	FLOWS			BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				PHOSPHORUS	
	TOTAL FLOW	AVERAGE DAY	MAXIMUM DAY	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT
	million gallons	mil. gal	mgd	mg/l	mg/l	%	10^3 pounds	mg/l	mg/l	%	10^3 pounds	mg/l P	mg/l P
JAN													
FEB													
MAR	3.9	.28	.35	169	28	83	5.5	188	27	86	6.3		
APR	13.8	.46	.67	201	33	84	23.2	423	33	92	53.8		
MAY	16.1	.52	.68					150	8	95	22.9		
JUNE	13.5	.45	.67					207	10	95	26.6		
JULY	6.5	.21	.26	170	11	94	10.3	109	7	94	6.6	8.2	3.8
AUG	5.2	.17	.20	170	5	97	8.6	88	5	94	4.3	8.0	3.6
SEPT	6.6	.22	.28	160	16	90	9.5	164	7	96	10.4	7.8	4.0
OCT	8.4	.27	.34	120	3	98	9.8	255	13	95	20.3	4.7	3.6
NOV	11.4	.38	.51		2			166	11	93	17.7		2.2
DEC	7.6	.24	.36					286	5	98	21.4		
TOTAL	93.0	-	-	-	-	-		-	-	-	162.8	-	-
AVG.		.32	MAXIMUM .68	173	19	89	14.3	184	9	95	16.3	7.2	3.4
No. of Samples	-	-	-	9	10	-	-	139	171	-	-	4	5

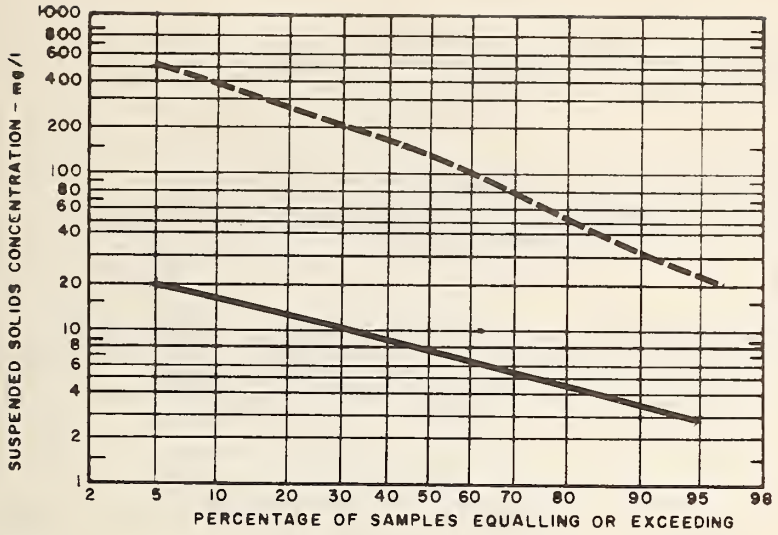
BIOCHEMICAL OXYGEN DEMAND

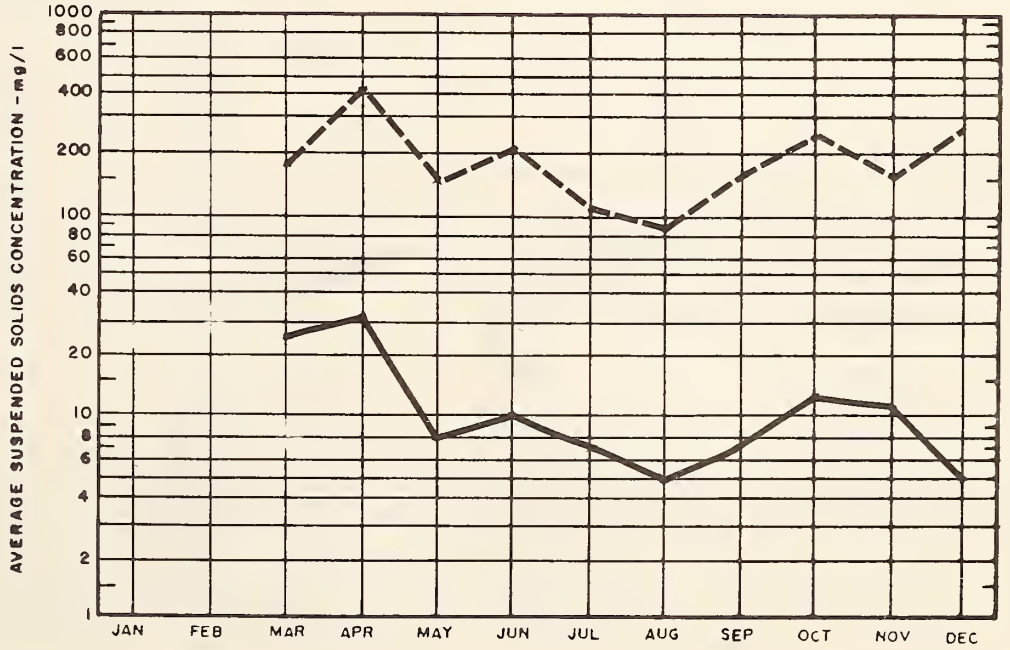




PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

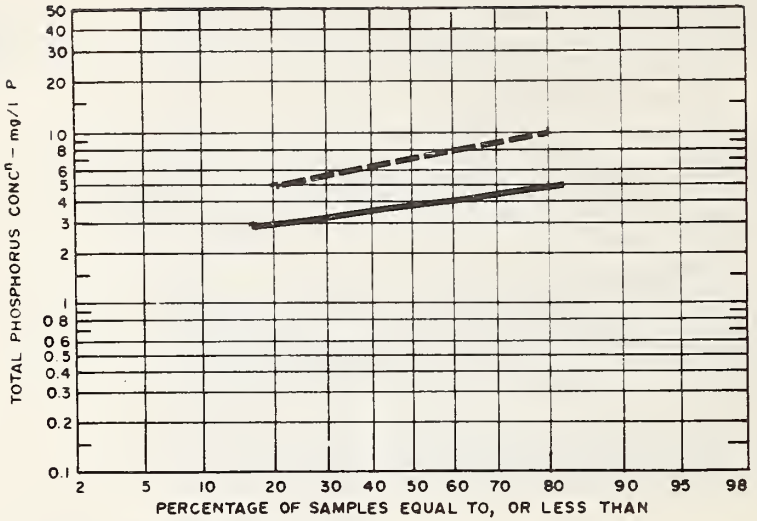
SUSPENDED SOLIDS

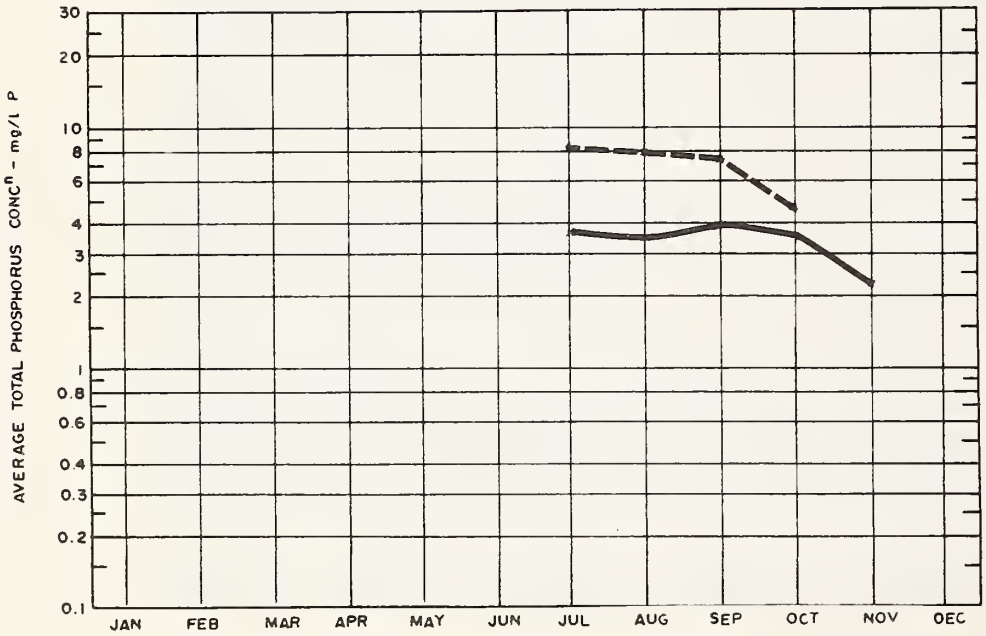




PLANT INFLUENT
PRIMARY EFFLUENT
PLANT EFFLUENT

PHOSPHORUS





PLANT INFLUENT

PLANT EFFLUENT

TREATMENT DATA

MONTH	GRIT	CHLORINATION		AERATION			WASTE SLUDGE			AEROBIC DIGESTER			
	QUANTITY REMOVED cubic feet	Cl_2 USED 10^3 pounds	AVG. DOSAGE mg/l	MLSS CONC mg/l	F/M day^{-1}	AIR USED 1000 ft / lb BOD	QUANTITY 10^6 gallons	SUSPENDED SOLIDS mg/l	VOL. SOLIDS %	QUANTITY REMOVED 10 gallons	SUSPENDED SOLIDS mg/l	VOL SOLIDS %	AMOUNT HAULED cubic yards
JAN													
FEB													
MAR	5	0		2600	.11	1.6	.013						
APR	14	0		4100	.14	.8							
MAY	49	0		4400									
JUNE	52	171	1.5	15000			.004						
JULY	43	334	5.1	12000	.02	2.9	.172						
AUG	33	238	4.6	10000	.01	2.8	.037	21000	52		32000	40	
SEPT	34	165	2.5	13000	.01	3.2		22000	44		23000	51	
OCT	34	253	3.7	12000	.01	2.1		18000			14000		
NOV	27	0		9000				19000	53		25000	38	
DEC	28	0		10000			.005	17000	40		23000	44	
TOTAL	319	1161*	–	–	–	–	.231	–	–		–	–	
AVG.	3.4 cu. ft/mil gal		3.2	9200	.05	2.2		19000	47		23000	43	

* Chlorination period June 6 to October 25

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